

What is claimed is:

1. An integrated light and accessory assembly for a motor vehicle,
comprising:

an insulator;

at least one reflector mounted on said insulator;

at least one conductor mounted on said insulator;

at least one lamp connected to said at least one conductor and
assembled inside said at least one reflector;

at least one module mounted on said insulator and connected to said
at least one conductor; and

a housing, enclosing the insulator, the at least one reflector, the at least
one conductor, the at least one lamp and the at least one control module,

wherein the lamp and the reflector are adapted to provide illumination,
and the conductor and controller are adapted to receive electrical power.

2. The assembly of Claim 1, wherein the lamp is selected from the
group consisting of a headlamp, a fog lamp, a side lamp, a parking lamp, a
hazard-warning lamp, a rear-illumination lamp, a dome lamp, and an interior
lamp.

3. The assembly of Claim 2, wherein the lamp is selected from the
group consisting of an incandescent lamp, an LED, and a high-intensity
discharge lamp.

4. The assembly of Claim 4, wherein the at least one lamp is releasably mounted inside the housing.

5. The assembly of Claim 1, wherein the at least one module is selected from the group consisting of a lighting control module, a power supply, a battery charger, a voltage source, a current source, a timer, a sequencer, and a microprocessor controller.

6. The assembly of Claim 1, further comprising a device mounted to the substrate and connected to least one conductor inside the housing, the device selected from the group consisting of an antenna, a sensor, and a transmitter.

7. The assembly of Claim 6, wherein the sensor is selected from the group consisting of a light detector, a video camera, a radar detector, a laser detector, an ultrasound detector, and an infrared detector.

8. The assembly of Claim 6, wherein the transmitter is selected from the group consisting of a toll transponder, a purchasing transponder, an RF transmitter, a microwave transmitter, and an IR transmitter.

9. The assembly of Claim 1, further comprising a power storage device mounted to the housing and connected to the at least one conductor.

10. The assembly of Claim 9, further comprising a switch between the power storage device and the at least one lamp.

11. The assembly of Claim 1, further comprising a functional module and an additional conductor, said functional module connected to said additional conductor, wherein said functional module is mounted to the insulator and is adapted to receive electric power from said additional conductor.

12. The assembly of Claim 11, wherein the functional module is selected from the group consisting of a video camera controller, a radar detector controller, an active radar controller, a collision avoidance controller, a controller for a toll-collection device, and a health-monitoring sensor module.

13. The assembly of Claim 1, further comprising an additional layer of insulation mounted to the at least one conductor, and a ground plane or return mounted to the additional layer of insulation.

14. An integrated light and accessory assembly for a motor vehicle, comprising:

an insulator;

at least one reflector mounted to said insulator;

at least one conductor mounted to said insulator;

at least one lamp connected to said at least one conductor and assembled inside said at least one reflector;

an electronic module mounted on said insulator and connected to said at least one conductor; and

5 a housing, enclosing the insulator, the at least one reflector, the at least one conductor, the at least one lamp and the at least one control module,

wherein the lamp and the reflector are adapted to provide illumination, and the conductor and controller are adapted to receive electrical power.

10 15. The integrated light and accessory assembly of Claim 14, wherein the integrated light and accessory assembly is selected from the group consisting of a headlamp, a fog lamp, a side lamp, a parking lamp, a hazard-warning lamp, a rear-illumination lamp, a dome lamp, and an interior lamp.

15 16. The integrated light and accessory assembly of Claim 14, wherein the electronic module is selected from the group consisting of a sensor, an antenna, a transmitter and a controller.

20 17. The integrated light and accessory assembly of Claim 16, wherein the sensor is selected from the group consisting of a light detector, a video camera, a radar detector, a laser detector, an ultrasound detector, and an infrared detector.

TOP SECRET 4E99550

5

18. The integrated light and accessory assembly of Claim 16, wherein the transmitter is selected from the group consisting of a toll transponder, a purchasing transponder, an RF transmitter, a microwave transmitter, and an IR transmitter.

10

19. The integrated light and accessory assembly of Claim 16, wherein the controller is selected from the group consisting of a lighting module controller, a video camera controller, a radar detector controller, an active radar controller, a collision avoidance controller, a controller for a toll-collection device, and a health-monitoring sensor module.

15

20. A method of manufacturing an integrated light and accessory assembly for a motor vehicle, the method comprising:
furnishing at least one metal foil;
selectively etching the at least one metal foil to form at least one trace;
molding the at least one foil to an insulator;
connecting a module and a lamp to the at least one trace, whereby the control module and lamp connect to a source of electric power; and
enclosing the foil, the insulator, the lamp and the module in a housing.

20

21. The method of Claim 20, wherein the at least one metal foil includes a second metal foil, and wherein molding the foils to an insulator forms at least one reflector on a first side of the insulator and a conductive path on a second side of the insulator.

22. The method of Claim 20, further comprising connecting a connector for an external connection.

5 23. A method of manufacturing an integrated light and accessory assembly, the method comprising:

 furnishing a reflective layer;

 molding the reflective layer between a first layer and a second layer of plastic;

10 adhering a conductive layer to one of said layers of plastic, forming a structural layer that comprises the reflective layer, first and second layers of plastic, and the conductive layer;

 mounting at least one illuminating lamp to said structural layer;

 mounting at least one device to said structural layer, the device

15 selected from the group consisting of a sensor, a module, a control module, an energy storage device, a transmitter, a transponder and an antenna;

 connecting said at least one illuminating lamp and said at least one device to said at least one traces; and

 enclosing the structural layer, the at least one illuminating lamp, and

20 the at least one device in a housing.

24. The method of Claim 23, further comprising adhering an insulating layer to said conductive layer to form the structural layer.

25. The method of Claim 23, further comprising connecting a connector for an external connection to said conductive layer.

26. A method of manufacturing an integrated light and accessory assembly for a motor vehicle, the method comprising:

- furnishing at least one metal foil;
- selectively etching the at least one metal foil to form at least one trace;
- bonding the at least one foil to an insulator;
- connecting a module and a lamp to the at least one trace, whereby the control module and lamp connect to a source of electric power; and
- enclosing the foil, the insulator, the lamp and the module in a housing.

27. The method of Claim 26, wherein the at least one metal foil includes a second metal foil, and wherein molding the foils to an insulator forms at least one reflector on a first side of the insulator and a conductive path on a second side of the insulator.

28. The method of Claim 26 wherein bonding is accomplished with an adhesive.

29. The method of Claim 26, further comprising connecting a connector for an external connection.